Previous Doc Next Doc Go to Doc#
First Hit Fwd Refs

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L12: Entry 5 of 8 File: USPT May 23, 2000

DOCUMENT-IDENTIFIER: US 6067442 A
TITLE: Satellite communications system having distributed user assignment and resource assignment with terrestrial gateways

Drawing Description Text (7):
FIG. 4A is a diagram of a first embodiment of a system data network that may be wholly or partially embodied within RF links interconnecting non-geosynchronous satellites and terrestrial gateways;

Detailed Description Text (38):
The DN 39 can be implemented as a terrestrial-only data network using wires and/or optical fiber. It is also within the scope of this invention to implement all or a portion of the DN 39 as a wireless link that interconnects the GWs 18, and also possibly the GOCC 38 and SOCC 36, through the constellation of satellites 12. In this regard reference can be had to FIG. 4A, wherein a plurality of gateways 18 are interconnected through space-based RF links that convey the DN 39 via satellites 12, while others are interconnected via a terrestrial data network. In this case the satellites 12 can include a C-band to C-band transponder or, by example, a C-band (uplink) to S-band (downlink) transponder. For this latter case one or more L-band and S-band traffic channels can be allocated for conveying the DN 39, and the GWs 18 then are provided with suitable L-band and S-band transmitter and receiver circuits and antenna(s), respectively, as may be the GOCC 38 and the SOCC 36. In FIG. 4A the satellites 12 may all be non-geosynchronous orbit satellites, while in FIG. 4B at least one of the satellites 12' can be a geosynchronous orbit satellite.

Detailed Description Text (68):
At Block N the selected gateway, for example the gateway D of FIG. 5, receives the access request from the UT 13. In this embodiment of the invention the selected gateway 18 performs a position location on the UT 13 using any of various position determining techniques such as multilateral time measurements, reception of UT 13 GPS information, or other means. At Block P the selected gateway 18 makes a determination, based at least in part on the position location, whether to accept or reject the UT 13. Other accept/reject criteria can also be used (e.g., whether or not a roaming agreement exists with the service provider of the user's home gateway). If the UT 13 is accepted, control passes to Block S where the UT 13 is authenticated and, assuming that the UT 13 is authenticated, the UT 13 is added to gateway's VLR 54c (FIG. 2) as an active user at this gateway. Control passes to Block T where the gateway notifies the UT 13 of acceptance and, if a call request was sent, begins call setup. At Block U the gateway determines if the UT 13 has initiated a call request. If No, control passes to Block V to enter a standby state waiting for a call request. At Block W the call request is received, and at Block X the gateway 18 assigns one or more traffic channels to the UT 13. The call is initiated and is in progress at Block Y. At Block Z the call terminates, and control passes back to Block V for the gateway 18 to wait for the next call request. If the determination at Block U is Yes, then control passes immediately to Block X to assign the one or more traffic channels to the UT 13.

CLAIMS:

13. A system as set forth in claim 8, wherein there are a plurality of gateways each of which has a gateway identifier, each of said plurality of gateways further comprising means for transmitting at least one gateway identifier to said second RF link for reception by said at least one user terminal when not accepting a request for service from said at least one user terminal, said at least one transmitted gateway identifier being selected at least in part in accordance with said determined location so as to indicate, to said user terminal, a gateway having a service area within which the user terminal is determined to be located.

Previous Doc Next Doc Go to Doc#

Previous Doc Next Doc Go to Doc#
First Hit Fwd Refs

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L12: Entry 6 of 8 File: USPT Jun 29, 1999

DOCUMENT-IDENTIFIER: US 5918157 A
TITLE: Satellite communications system having distributed user assignment and resource assignment with terrestrial gateways

Drawing Description Text (7):
FIG. 4A is a diagram of a first embodiment of a system data network that may be wholly or partially embodied within RF links interconnecting non-geosynchronous satellites and terrestrial gateways;

Detailed Description Text (37):
The DN 39 can be implemented as a terrestrial-only data network using wires and/or optical fiber. It is also within the scope of this invention to implement all or a portion of the DN 39 as a wireless link that interconnects the GWs 18, and also possibly the GOCC 38 and SOCC 36, through the constellation of satellites 12. In this regard reference can be had to FIG. 4A, wherein a plurality of gateways 18 are interconnected through space-based RF links that convey the DN 39 via satellites 12, while others are interconnected via a terrestrial data network. In this case the satellites 12 can include a C-band to C-band transponder or, by example, a C-band (uplink) to S-band (downlink) transponder. For this latter case one or more L-band and S-band traffic channels can be allocated for conveying the DN 39, and the GWs 18 then are provided with suitable L-band and S-band transmitter and receiver circuits and antenna(s), respectively, as may be the GOCC 38 and the SOCC 36. In FIG. 4A the satellites 12 may all be non-geosynchronous orbit satellites, while in FIG. 4B at least one of the satellites 12' can be a geosynchronous orbit satellite.

Detailed Description Text (66):
At Block N the selected gateway, for example the gateway D of FIG. 5, receives the access request from the UT 13. In this embodiment of the invention the selected gateway 18 performs a position location on the UT 13 using any of various position determining techniques such as multilateral time measurements, reception of UT 13 GPS information, or other means. At Block P the selected gateway 18 makes a determination, based at least in part on the position location, whether to accept or reject the UT 13. Other accept/reject criteria can also be used (e.g., whether or not a roaming agreement exists with the service provider of the user's home gateway). If the UT 13 is accepted, control passes to Block S where the UT 13 is authenticated and, assuming that the UT 13 is authenticated, the UT 13 is added to gateway's VLR 54c (FIG. 2) as an active user at this gateway. Control passes to Block T where the gateway notifies the UT 13 of acceptance and, if a call request was sent, begins call setup. At Block U the gateway determines if the UT 13 has initiated a call request. If No, control passes to Block V to enter a standby state waiting for a call request. At Block W the call request is received, and at Block X the gateway 18 assigns one or more traffic channels to the UT 13. The call is initiated and is in progress at Block Y. At Block Z the call terminates, and control passes back to Block V for the gateway 18 to wait for the next call request. If the determination at Block U is Yes, then control passes immediately to Block X to assign the one or more traffic channels to the UT 13.

CLAIMS:

9. A satellite communications system as set forth in claim 1, wherein said at least one communications satellite is one of a constellation of non-geosynchronous orbit communications satellites, and wherein said at least one earth orbiting satellite is a geosynchronous orbit satellite.

Previous Doc Next Doc Go to Doc#

Previous Doc Next Doc Go to Doc#
First Hit Fwd Refs

Generate Collection

L12: Entry 7 of 8 File: USPT May 11, 1999

DOCUMENT-IDENTIFIER: US 5903837 A
TITLE: Wireless telephone/satellite roaming method

Detailed Description Text (126):
If the user location is such that a remote gateway is selected, the desired gateway is coded as a remote call and passes it to the cellular telephone system w/switch 221 to process the call, whereupon it instructs the cellular telephone system W/Switch 221 to switch the call to the selected MSA/RSA gateway. The cellular telephone system w/switch 221 signals the remote MSA/RSA gateway via packet switched network lines 130,131 of the existence of the incoming call request and the information for call setup. The cellular telephone system w/switch 221 then calls the remote MSA/RSA gateway equipment so selected 101,102 via line 120,121. The remote MSA/RSA gateway is now connected to the caller unit 106,107 via the Telephone Central Office or other means 105. The cellular telephone system w/switch 221 receives the coded signal and opens a line. The information for the call setup is sent to the Cellular Telephone Interface Unit 230 for call setup processing.

CLAIMS:

1. A method for communicating through a wireless telephone/satellite telecommunications system having at least one satellite in non-geosynchronous earth orbit, gateways into a terrestrial telecommunications system, and at least one wireless transceiver user capable of direct two-way communication of communications traffic with a satellite from within a satellite service area, said method comprising the steps of:

maintaining a central network database management system;

maintaining on-board each satellite a database of active users;

identifying each wireless transceiver user with a single terrestrial service area having linking capabilities to said network database management system; and

linking a satellite to a wireless transceiver user based on information stored on-board said satellite in said database of active users; wherein

communications traffic between a wireless transceiver user and said terrestrial telecommunications system is effected via only a single relay from the group of relays comprising a single satellite and a succession of orbiting satellites.

Previous Doc Next Doc Go to Doc#

Previous Doc Next Doc Go to Doc#
First Hit Fwd Refs

Generate Collection

L12: Entry 8 of 8 File: USPT Feb 3, 1998

DOCUMENT-IDENTIFIER: US 5715297 A
TITLE: Wireless telephone/satellite roaming system

Detailed Description Text (126):
If the user location is such that a remote gateway is selected, the desired gateway is coded as a remote call and passes it to the cellular telephone system w/switch 221 to process the call, whereupon it instructs the cellular telephone system W/Switch 221 to switch the call to the selected MSA/RSA gateway. The cellular telephone system w/switch 221 signals the remote MSA/RSA gateway via packet switched network lines 130,131 of the existence of the incoming call request and the information for call setup. The cellular telephone system w/switch 221 then calls the remote MSA/RSA gateway equipment so selected 101,102 via line 120,121. The remote MSA/RSA gateway is now connected to the caller unit 106,107 via the Telephone Central Office or other means 105. The cellular telephone system w/switch 221 receives the coded signal and opens a line. The information for the call setup is sent to the Cellular Telephone Interface Unit 230 for call setup processing.

CLAIMS:

1. A method for communicating through a wireless telephone/satellite telecommunications system having at least one satellite in non-geosynchronous earth orbit, gateways into a terrestrial telecommunications system, and at least one wireless transceiver user capable of direct two-way communication of communications traffic with a satellite from within a satellite service area, said method comprising the steps of:

maintaining a central network database management system;

maintaining on-board each satellite a database of active users, each database of active users containing an identification of each active user, a physical location of each active user, and a home gateway of each active user;

identifying each wireless transceiver user with a single terrestrial service area having linking capabilities to said network database management system; and

linking a satellite to a wireless transceiver user based on information stored on-board said satellite in said database of active users; wherein

communications traffic that said user wishes to send to a recipient is not directly passed between satellites over an intersatellite link; and

said system comprises at least a first satellite and a second satellite, said method further comprising the step of:

processing said information in said database of active users on-board said first satellite to effect hand-off of said communications links from said first satellite to said second satellite, including transferring to the second satellite that part of the database containing those active users leaving the range of the first satellite and entering the range of the second satellite.

3. A method for communicating through a wireless telephone/satellite telecommunications system having at least one satellite in non-geosynchronous earth orbit, gateways into a terrestrial telecommunications system, and at least one wireless transceiver user capable of direct two-way communication of communications traffic with a satellite from within a satellite service area, said method comprising the steps of:

maintaining a central network database management system;

maintaining on-board each satellite a database of active users, each database of active users containing an identification of each active user, a physical location of each active user, and a home gateway of each active user;

identifying each wireless transceiver user with a single terrestrial service area having linking capabilities to said network database management system; and

linking a satellite to a wireless transceiver user based on information stored on-board said satellite in said database of active users; wherein

communications traffic that said user wishes to send to a recipient is not directly passed between satellites over an intersatellite link, said method further comprising the steps of:

establishing a wireless transceiver user as a roamer by means of said user issuing a request for roaming; and

updating the database of active users to include said user.

6. A method for communicating through a wireless telephone/satellite telecommunications system having at least one satellite in non-geosynchronous earth orbit, gateways into a terrestrial telecommunications system, and at least one wireless transceiver user capable of direct two-way communication of communications traffic with a satellite from within a satellite service area, said method comprising the steps of:

maintaining a central network database management system;

maintaining on-board each satellite a database of active users, each database of active users containing an identification of each active user, a physical location of each active user, and a home gateway of each active user;

identifying each wireless transceiver user with a single terrestrial service area having linking capabilities to said network database management system; and

linking a satellite to a wireless transceiver user based on information stored on-board said satellite in said database of active users; wherein

communications traffic that said user wishes to send to a recipient is not directly passed between satellites over an intersatellite link;

the user initiates an inbound call;

the satellite authenticates the user using its onboard database;

the satellite accepts the inbound call from the user if the user has been authenticated; and

the satellite establishes gateway routing for call setup;

said initiating, authenticating, accepting, and establishing steps being performed without participation from the ground.

8. A method for communicating through a wireless telephone/satellite telecommunications system having at least one satellite in non-geosynchronous earth orbit, gateways into a terrestrial telecommunications system, and at least one wireless transceiver user capable of direct two-way communication of communications traffic with a satellite from within a satellite service area, said method comprising the steps of:

maintaining a central network database management system;

maintaining on-board each satellite a database of active users, each database of active users containing an identification of each active user, a physical location of each active user, and a home gateway of each active user;

identifying each wireless transceiver user with a single terrestrial service area having linking capabilities to said network database management system; and

linking a satellite to a wireless transceiver user based on information stored on-board said satellite in said database of active users; wherein

communications traffic that said user wishes to send to a recipient is not directly passed between satellites over an intersatellite link;

the user initiates an outbound call;

the satellite authenticates the user using its onboard database;

the satellite accepts the outbound call from the user if the user has been authenticated; and

the satellite establishes gateway routing for call setup;

said initiating, authenticating, accepting, and establishing steps being performed without participation from the ground.

Previous Doc Next Doc Go to Doc#

WEST Search History

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Hide?	Set Name	Query	Hit Count
	DB=PGPB,USPT; PLUR=YES; OP=ADJ		
☐	L30	20000502	9
☐	L29	L28 and l2	13
☐	L28	gateway same (DNS near8 query)	98
☐	L27	gateway same DNS	885
☐	L26	L24 and l8	8
☐	L25	L24 and l12	3
☐	L24	Inter-Satellite adj link	149
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☐	L23	5812932.pn.	1
☐	L22	5884142.pn.	1
☐	L21	5448623.pn.	1
☐	L20	5594780.pn.	1
☐	L19	6804514.pn.	1
☐	L18	6735440.pn.	1
	DB=PGPB,USPT; PLUR=YES; OP=ADJ		
☐	L17	L16 and l15	1
☐	L16	global .ti.	1514
☐	L15	L14 or l13	259
☐	L14	(el-hady or el adj hady or elhady).xp.	118
☐	L13	(el-hady or el adj hady or elhady).xa.	141
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☐	L11	non-geosynchronous	348
☐	L10	((select oe selection or selected) near8 gateway) same (country or location or region)	152
☐	L9	L8 and URL	1
☐	L8	L7 and (country or location or region)	74
☐	L7	L6 and l2	76
☐	L6	mobile adj2 satellite	2086
☐	L5	L4 and URL	62
☐	L4	L3 and (country or location or region)	315

WEST Search History

Hide Items | Restore | Clear | Cancel

DATE: Tuesday, February 01, 2005

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☐	L21	5448623.pn.	1
☐	L20	5594780.pn.	1
☐	L19	6804514.pn.	1
☐	L18	6735440.pn.	1
	DB=PGPB,USPT; PLUR=YES; OP=ADJ		
☐	L17	L16 and l15	1
☐	L16	global .ti.	1514
☐	L15	L14 or l13	259
☐	L14	(el-hady or el adj hady or elhady).xp.	118
☐	L13	(el-hady or el adj hady or elhady).xa.	141
☐	L12	L11 and l10	8
☐	L11	non-geosynchronous	348
☐	L10	((select oe selection or selected) near8 gateway) same (country or location or region)	152
☐	L9	L8 and URL	1
☐	L8	L7 and (country or location or region)	74
☐	L7	L6 and l2	76
☐	L6	mobile adj2 satellite	2086
☐	L5	L4 and URL	62
☐	L4	L3 and (country or location or region)	315
☐	L3	L2 and satellite	350
☐	L2	(select oe selection or selected) near8 gateway	1283
	DB=USPT; PLUR=YES; OP=ADJ		
☐	L1	(select oe selection or selected) near8 gateway	619

END OF SEARCH HISTORY

Previous Doc Next Doc Go to Doc#
First Hit Fwd Refs

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L25: Entry 2 of 3 File: USPT May 23, 2000

DOCUMENT-IDENTIFIER: US 6067442 A
TITLE: Satellite communications system having distributed user assignment and resource assignment with terrestrial gateways

Drawing Description Text (7):
FIG. 4A is a diagram of a first embodiment of a system data network that may be wholly or partially embodied within RF links interconnecting non-geosynchronous satellites and terrestrial gateways;

Detailed Description Text (38):
The DN 39 can be implemented as a terrestrial-only data network using wires and/or optical fiber. It is also within the scope of this invention to implement all or a portion of the DN 39 as a wireless link that interconnects the GWs 18, and also possibly the GOCC 38 and SOCC 36, through the constellation of satellites 12. In this regard reference can be had to FIG. 4A, wherein a plurality of gateways 18 are interconnected through space-based RF links that convey the DN 39 via satellites 12, while others are interconnected via a terrestrial data network. In this case the satellites 12 can include a C-band to C-band transponder or, by example, a C-band (uplink) to S-band (downlink) transponder. For this latter case one or more L-band and S-band traffic channels can be allocated for conveying the DN 39, and the GWs 18 then are provided with suitable L-band and S-band transmitter and receiver circuits and antenna(s), respectively, as may be the GOCC 38 and the SOCC 36. In FIG. 4A the satellites 12 may all be non-geosynchronous orbit satellites, while in FIG. 4B at least one of the satellites 12' can be a geosynchronous orbit satellite.

Detailed Description Text (68):
At Block N the selected gateway, for example the gateway D of FIG. 5, receives the access request from the UT 13. In this embodiment of the invention the selected gateway 18 performs a position location on the UT 13 using any of various position determining techniques such as multilateral time measurements, reception of UT 13 GPS information, or other means. At Block P the selected gateway 18 makes a determination, based at least in part on the position location, whether to accept or reject the UT 13. Other accept/reject criteria can also be used (e.g., whether or not a roaming agreement exists with the service provider of the user's home gateway). If the UT 13 is accepted, control passes to Block S where the UT 13 is authenticated and, assuming that the UT 13 is authenticated, the UT 13 is added to gateway's VLR 54c (FIG. 2) as an active user at this gateway. Control passes to Block T where the gateway notifies the UT 13 of acceptance and, if a call request was sent, begins call setup. At Block U the gateway determines if the UT 13 has initiated a call request. If No, control passes to Block V to enter a standby state waiting for a call request. At Block W the call request is received, and at Block X the gateway 18 assigns one or more traffic channels to the UT 13. The call is initiated and is in progress at Block Y. At Block Z the call terminates, and control passes back to Block V for the gateway 18 to wait for the next call request. If the determination at Block U is Yes, then control passes immediately to Block X to assign the one or more traffic channels to the UT 13.

Detailed Description Text (82):

configurations, such as polar-orbiting LEO satellites, elliptically orbiting LEO satellites, satellites in Medium Earth Orbit configurations, and geo-synchronous satellites. Furthermore, in some embodiments of this invention some or all of the user acceptance and/or logging-in functions can be performed on-board a satellite, either alone or in cooperation with one of the gateways 18. If the satellites are equipped with inter-satellite links (such as RF or optical links), then information can be passed between the satellites, and the user acceptance and/or logging-in functions as described above can be performed by two or more cooperating satellites, either alone or in combination with at least one gateway 18.

CLAIMS:

13. A system as set forth in claim 8, wherein there are a plurality of gateways each of which has a gateway identifier, each of said plurality of gateways further comprising means for transmitting at least one gateway identifier to said second RF link for reception by said at least one user terminal when not accepting a request for service from said at least one user terminal, said at least one transmitted gateway identifier being selected at least in part in accordance with said determined location so as to indicate, to said user terminal, a gateway having a service area within which the user terminal is determined to be located.

Previous Doc Next Doc Go to Doc#

Previous Doc Next Doc Go to Doc#
First Hit

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L26: Entry 2 of 8 File: PGPB Mar 14, 2002

DOCUMENT-IDENTIFIER: US 20020031103 A1
TITLE: User terminal employing quality of service path determination and bandwidth saving mode for a satellite ISP system using non-geosynchronous orbit satellites

Abstract Paragraph:
Methods are provided for operating a mobile satellite telecommunications system, as is a system that operates in accordance with the methods. A first method has steps of providing at least one user terminal, at least one satellite in earth orbit and at least one gateway bidirectionally coupled to a data communications network and, responsive to applications, selecting with the user terminal individual ones of a plurality of Quality of Service (QoS) modes for servicing different application requirements. The method further includes communicating a request for a selected one of the QoS modes at least to the gateway. Another method operates in response to stored satellite ephemeris information for selecting a path through the satellite constellation to a destination gateway for routing a communication to or from the data communication network and the user terminal, and for transmitting a description of the selected path from the user terminal to at least one of the constellation of satellites. Another method operates so as to reduce an amount of information contained within a packet header after transmitting a first packet to at least one satellite of the constellation of satellites. Preferably the packet header of the first packet contains information that is descriptive of at least an identification of a source address and a destination address of the packet, and a connection identifier identifying a communication connection to which the packet belongs, whereas headers of subsequent packets of the communication connection contain only the connection identifier. The method further extracts and stores the information from the header of the first packet in the satellites, and routes subsequent packets based on the stored information and on the connection identifier. The method further expands the subsequently transmitted packet headers to contain the stored information prior to being transmitted to the data communication network.

Summary of Invention Paragraph:
[0003] In U.S. patent application Ser. No. 09/334,386, filed Jun. 16, 1999, entitled "ISP System Using Non-Geosynchronous Orbiting Satellites," by Robert A. Wiedeman, there are disclosed embodiments of satellite-based communication systems that extend the Internet using non-geosynchronous orbit satellites. A user in a remote location can use the LEO constellation to access the Internet. The satellites in this system become part of the Internet and act as access points for User Terminals (UTs) in remote areas. This U.S. patent application is incorporated by reference in its entirety, insofar as it does not conflict with these teachings.

Summary of Invention Paragraph:
[0007] In a first aspect of these teachings a method is provided for operating a mobile satellite telecommunications system, as is a system that operates in accordance with the method. The method has steps of providing at least one user terminal, at least one satellite in earth orbit and at least one gateway bidirectionally coupled to a data communications network and, responsive to applications, selecting with the user terminal individual ones of a plurality of

Quality of Service (QoS) modes for servicing different application requirements. The method further includes communicating a request for a selected one of the QoS modes at least to the gateway, and in response allocating resources to accommodate the requested QoS mode. The method may select one of a circuit switched or a packet switched mode of operation with the user terminal. Preferably the user is billed a greater amount for use of a QoS of higher quality.

Summary of Invention Paragraph:
[0009] In a further aspect of these teachings a method provides at least one user terminal, a constellation of satellites in earth orbit and at least one gateway bidirectionally coupled to a data communications network and, in response to at least stored satellite ephemeris information, selects a path through the satellite constellation to a destination gateway for routing a communication to or from the data communication network and the user terminal, and transmits a description of the selected path from the user terminal to at least one of the constellation of satellites. The selection of the path is further responsive to stored gateway location information for selecting the path through the satellite constellation to the destination gateway.

Brief Description of Drawings Paragraph:
[0012] FIG. 1 is a simplified block diagram of a mobile satellite telecommunications system (MSTS) that is suitable for practicing these teachings;

Detail Description Paragraph:
[0015] Reference is made to FIG. 1 for illustrating a simplified block diagram of a digital wireless telecommunications system, embodied herein as a mobile satellite telecommunications system (MSTS) 1, that is suitable for practicing these teachings. While described in the context of the MSTS 1, those skilled in the art should appreciate that certain of these teachings may have application to terrestrial telecommunications systems as well.

Detail Description Paragraph:
[0016] The MSTS 1 includes at least one, but typically many, wireless user terminals (UTs) 10, at least one, but typically several, communications satellite 40, and at least one, but typically several, communications ground stations or gateways 50. In FIG. 1 three satellites are shown for convenience, with one being designated satellite 40A, one satellite 40B and one satellite 40C, hereafter collectively referred to as satellite or satellites 40. The satellites 40 preferably contain an on-board processor (OBP) 42 and an on-board memory (MEM) 43. An Inter-Satellite Link (ISL) 44 is shown between satellites 40A, 40B and 40C. The ISL 41 could be implemented using an RF link or an optical link, and is modulated with information that is transferred between the satellites 40, as described in further detail below. More than three satellites 40 can be coupled together using ISLs 41.

Detail Description Paragraph:
[0017] Reference with regard to satellite-based communications systems can be had, by example, to U.S. Pat. No. 5,526,404, "Worldwide Satellite Telephone System and a Network Coordinating Gateway for Allocating Satellite and Terrestrial Resources", by Robert A. Wiedeman and Paul A. Monte; to U.S. Pat. No. 5,303,286, "Wireless Telephone/ Satellite Roaming System", by Robert A. Wiedeman; to U.S. Pat. No. 5,619,525, "Closed Loop Power Control for Low Earth Orbit Satellite Communications System, by Robert A. Wiedeman and Michael J. Sites; and to U.S. Pat. No. 5,896,558 "Interactive Fixed and Mobile Satellite Network", by Robert A. Wiedeman, for teaching various embodiments of satellite communications systems, such as low earth orbit (LEO) satellite systems, that can benefit from these teachings. The disclosures of these various U.S. patents are incorporated by reference herein in their entireties, in so far as they do not conflict with the teachings of this invention.

Detail Description Paragraph:
[0024] Having thus described one suitable but not limiting embodiment of a mobile satellite telecommunications system that can be used to practice these teachings, a description of the preferred embodiments of these teachings will now be a provided.

Detail Description Paragraph:
[0052] In this regard it can be appreciated that the gateway 50, the moving non-GEO satellites 40, and all of the active UTs 10 essentially form a routing network. All of the nodes in the network require a capability to communicate with other nodes. In satellite systems with on-board routing capability, the satellites employ a routing algorithm and ephemeris data of the moving satellite constellation to route the packets and close the circuits. In this case the satellites may have the inter-satellite links (ISLs) 41 for providing communication RF or IR paths between satellites in space, thereby enabling a packet to be routed from one satellite to another until the packet is finally downlinked to either the UT 10 or to the gateway 50.

Detail Description Paragraph:
[0054] To avoid these problems, and referring again to FIG. 1, the UT 10 has the capability to set up connections and route the packets. In this aspect of these teachings the memory 18A, or an external memory that is accessible to the UT 10, stores the ephemeris data (ED) of the moving satellite constellation. The memory 18A also stores information that specifies the locations of the gateways 50 (GWL), including the location of the gateway that the UT 10 is attempting to reach. With this information, and using a routing algorithm (RA) also stored in the memory 18A, the controller 18 of the UT 10 is enabled to define a path through one or more satellites 40 to the gateway 50 that the UT 10 desires to access. Once a UT 10 has determined the path as defined by the nodes in the path (e.g, satellite 40A to satellite 40B to satellite 40C to gateway X, it establishes a circuit to the desired gateway by transmitting pathing or routing-related information to the satellites 40, defining which satellite(s) 40 are to participate in the path between the UT 10 and the desired gateway. In this manner the UT 10 essentially establishes a circuit in space between itself and a desired terrestrial termination point for the communication.

Detail Description Paragraph:
[0055] Note that it is within the scope of these teachings to store the ephemeris data, gateway location data and the routing algorithm in the attached PC 37, to execute the routing algorithm in the PC 37, and to transmit the selected route to the satellite or satellites 40 using the UT 10 service links 39.

CLAIMS:

1. A mobile satellite telecommunications system, comprising: at least one user terminal; at least one satellite in earth orbit; and at least one gateway bidirectionally coupled to a data communications network; said user terminal comprising a controller responsive to applications for selecting individual ones of a plurality of Quality of Service (QoS) modes for servicing different application requirements.

2. A system as in claim 1, wherein said user terminal operates to communicate a request for a selected one of said QoS modes at least to said gateway, and in response the system allocates resources to accommodate the requested QoS mode.

6. A mobile satellite telecommunications system, comprising: at least one user terminal; a constellation of satellites in earth orbit; at least one gateway bidirectionally coupled to a data communications network; and a processor responsive at least to stored satellite ephemeris information for selecting a path through said satellite constellation to a destination gateway for routing a

communication to or from said data communication network and said user terminal, and for causing a description of said selected path to be transmitted from said user terminal to at least one of said constellation of satellites.

7. A system as in claim 6, wherein said processor is further responsive to stored gateway location information for selecting said path through said satellite constellation to said destination gateway.

8. A mobile satellite telecommunications system, comprising: at least one user terminal; a constellation of satellites in earth orbit; and at least one gateway bidirectionally coupled to a data communications network; said user terminal comprising a controller operable for reducing an amount of information contained within a packet header after transmitting a first packet to at least one satellite of said constellation of satellites.

14. A method for operating a mobile satellite telecommunications system, comprising: providing at least one user terminal, at least one satellite in earth orbit and at least one gateway bidirectionally coupled to a data communications network; and responsive to applications, selecting with said user terminal individual ones of a plurality of Quality of Service (QoS) modes for servicing different application requirements.

15. A method as in claim 14, and further comprising communicating a request for a selected one of said QoS modes at least to said gateway, and in response allocating resources to accommodate the requested QoS mode.

19. A method for operating a mobile satellite telecommunications system, comprising: providing at least one user terminal, a constellation of satellites in earth orbit and at least one gateway bidirectionally coupled to a data communications network; and responsive at least to stored satellite ephemeris information, selecting a path through said satellite constellation to a destination gateway for routing a communication to or from said data communication network and said user terminal, and transmitting a description of said selected path from said user terminal to at least one of said constellation of satellites.

20. A method as in claim 19, wherein the step of selecting a path is further responsive to stored gateway location information for selecting said path through said satellite constellation to said destination gateway.

21. A method for operating a mobile satellite telecommunications system, comprising: providing at least one user terminal, a constellation of satellites in earth orbit and at least one gateway bidirectionally coupled to a data communications network; and reducing an amount of information contained within a packet header after transmitting a first packet to at least one satellite of said constellation of satellites.

Previous Doc Next Doc Go to Doc#

Previous Doc Next Doc Go to Doc#
First Hit Fwd Refs

Generate Collection

L26: Entry 4 of 8 File: USPT Aug 7, 2001

DOCUMENT-IDENTIFIER: US 6272316 B1
TITLE: Mobile satellite user information request system and methods

Abstract Text (1):
A method in accordance with this invention for operating a satellite communications system of a type that has a plurality of earth orbiting satellites, at least one terrestrial user terminal, and at least one terrestrial gateway, includes steps of determining a location and an azimuthal orientation of the user terminal; determining locations of one or more satellites co-visible to the user terminal and to the gateway; determining a signal quality of paths to each satellite co-visible with the gateway; displaying a representation to an operator of the user terminal, the representation depicting at least the orientation of the user terminal, the determined locations of the one or more satellites, and the determined signal qualities for satellites that are in use and those that are not in use; and changing the location of the user terminal in response to the displayed representation. Also, an unattended user terminal located a desired geographical position can generate a map of the sky over a period of time, the map indicating satellite availability at the desired position. The map can subsequently be used by the user terminal and/or the gateway to schedule communications, thereby conserving one or both of system capacity and user terminal battery power.

Parent Case Text (2):
This patent application is a continuation-in-part of U.S. patent application Ser. No. 08/559,081, filed Nov. 17, 1995, now U.S. Pat. No. 5,812,932 entitled "Mobile Satellite User Information Request System and Method", by Robert A. Wiedeman, Paul A. Monte, and Kent A. Penwarden, the disclosure of which is incorporated by reference herein in its entirety.

Brief Summary Text (5):
With known types of mobile user satellite systems, particularly geosynchronous satellite systems, generally only one satellite is in view of the user. Furthermore, the location of the satellite, on or about the equator, specifies the direction from the user to the satellite. In the northern hemisphere this direction is generally south.

Brief Summary Text (6):
However, recent advances in the communication, computer, and small satellite technology has enabled the concept of providing a constellation of satellites, wherein over large portions of the Earth's surface at least two satellites can be in view of any location. Furthermore, the development of hand-held user terminals using Code Division Multiple Access (CDMA) has made possible multiple satellite coverage employing diversity techniques as a means of mitigating shadowing and blocking of users. By example, a user terminal is enabled to maintain a connection simultaneously through two or more sat ellites of a constellation of LEO satellites that are simultaneously in view.

Brief Summary Text (8):
For a constellation of earth orbit satellites (in non-polar orbits) it can be shown that the portion of the sky wherein a user will "see" the satellites is a function

of latitude. At the equator (0.degree. latitude) the sky is uniformly covered by satellite tracks, whereas at approximately 70.degree. north latitude in only a relatively small portion of the southern sky will a user see a satellite. For intermediate latitudes the size of the region wherein no satellites are found, referred to herein as "obscura", grows progressively small as the equator is approached. The southern latitude case is the mirror image of the northern latitude case for circular orbits.

Brief Summary Text (9):
Furthermore, in a typical case a variety of signal blocking obstructions are found, such as buildings, utility poles, trees, etc., in addition to the region wherein no satellites pass (obscura). It should be apparent that at any given time only a portion of the sky may be optimum for carrying a communication between a terrestrial user terminal and one or more of the satellites.

Brief Summary Text (12):
It is an object of this invention to provide improved methods and apparatus to assist a user of a mobile communication satellite system to log on to, initiate and receive calls, and maintain calls.

Brief Summary Text (15):
This teaching of this invention exploits the fact that a gateway within whose service area a user terminal is located is aware of the location (latitude and longitude) of the user terminal, and can compute from satellite ephemerides data the locations and elevation angles of all satellites in view of the user terminal. Alternatively, the gateway can send satellite ephemerides data to the user terminal, which can then compute the locations and elevation angles of the satellite(s) in view.

Brief Summary Text (18):
A method in accordance with this invention for operating a satellite communications system of a type that has a plurality of earth orbiting satellites, at least one terrestrial user terminal, and at least one terrestrial gateway, includes steps of determining a location and an azimuthal orientation of the user terminal; determining locations of one or more satellites co-visible to the user terminal and to the gateway; determining a signal quality of paths to each satellite co-visible with the gateway; displaying a representation to an operator of the user terminal, the representation depicting at least the orientation of the user terminal, the determined locations of the one or more satellites, and the determined signal qualities for satellites that are in use and those that are not in use; and changing the location of the user terminal in response to the displayed representation.

Brief Summary Text (19):
In the presently preferred embodiment the step of determining the locations of the one or more satellites includes a step of determining an elevation angle of each of the one or more satellites relative to the location of the user terminal, and the step of displaying also displays a representation of the determined elevation angle. The step of displaying may also include an initial step of transmitting path quality information from the gateway to the user terminal through at least one satellite, and/or from the user terminal to the gateway through at least one satellite.

Brief Summary Text (20):
Further in accordance with this invention the step of displaying includes a step of displaying a graphic presentation of the sky which comprises indications of the location, elevation angle and direction of movement of the co-visible satellites, and also an azimuthal orientation of the user terminal. The graphic presentation of the sky may also include an indication of an obscura region of the sky that is devoid of satellites.

DOCUMENT-IDENTIFIER: US 20010055299 A1
TITLE: METHOD AND APPARATUS FOR ESTABLISHING COMMUNICATIONS BETWEEN PACKET-SWITCHED AND CIRCUIT-SWITCHED NETWORKS

Application Filing Date:
19970814

Detail Description Paragraph:
[0055] Referring to FIG. 6, a recursive process of resolving the telephone number domain name previously entered into the WebPhone client to the appropriate IP address of a gateway on a PSTN is illustrated conceptually: In step 1, the WebPhone client 232 forwards the telephone number domain name to primary name server 254 in packetized form via Internet 220 and ISP 250. Using a name packet, primary name server 254 queries the root name server of the domain name system (DNS) for the address of "4001.997.561.1.carrier.com" in step 2. The name server for the DNS root returns a reference to the name server for ".com" in step 3. Next, name server 254 queries the referenced name server ".com" for the address of "4001.997.561.1.carrier.com" in step 4. In response, a referral to "carrier.com" is returned in step 5. Name server 254 then queries the name server "carrier.com" for "4001.997.561.1.carrier.com" in step 6. In response, a referral to "1.carrier.com" is returned in step 7. Name server 254 then queries the name server to "1.carrier.com," for "4001.997.561.1.carrier.com" in step 8. In response a reference of "561.1.carrier.com", is returned in step 9. Name server 254 then queries name server for "561.1.carrier.com," in step 10 for "4001.997.561.1.carrier.com." In response, a reference to "997.561.1.carrier.com" is returned in step 11. This last reference contains the IP address of the desired gateway which is then forwarded via Internet 220 and ISP 250 to WebPhone client 232 by name server 254 in step 12. In the above-described process, the resolution is executed to the level of the exchange code "997." It will be obvious to those reasonably skilled in the art that the domain name level may be further resolved if the appropriate name server hierarchy is arranged to allow for resolution to the actual subscriber number domain level or partial subscriber number level. In such an embodiment, specific gateways would be associated with subscriber numbers, therefore allowing the additional step of resolution, using the domain name system.

Detail Description Paragraph:
[0058] The reader will appreciate from the foregoing description that the invention provides a method in which an Internet telephone such as the WebPhone clients may specify a traditional telephone number, have that telephone number translated into the IP address of an appropriate gateway by the existing Domain Name System on the Internet, and have the gateway perform the connection through to the telephone on the public switched telephone network. By utilizing the invention as previously described, a gateway may be selected on a least cost routing basis to minimize the toll charges on a traditional PSTN network. For example, if a call is originating with an Internet telephone in the United States to a PSTN apparatus in Germany, the invention may be utilized to identify a gateway in Germany proximate to the terminating apparatus rather than a gateway in the United States. As such, a substantial portion of the costs of the call can be transmitted over the Internet

more cheaply than if traditional long-distance and overseas carrier lines were utilized.

Detail Description Paragraph:
[0066] The technique utilized in the previously described Scenario 2 may be utilized to establish calls originating and ending at PSTN apparatus, but which utilize a portion of a IP-based network, typically to reduce costs. For example, in the previously described scenario, instead of contacting a global server for the IP address of the destination WebPhone client, the gateway would be configured with information relating to which other gateway would be most suitable in accordance with any number of predetermined conditions, including lease cost routing, to complete the call. The initially contacted gateway would then contact the selected gateway, using either the E-mail address of the gateway or a fixed IP address and offer a call packet, including the destination phone number. If the call is accepted, a real-time communication link will be established from telephone 214A, to gateway 218B, through ISP 250B, Internet 220, ISP 250C, gateway 218C, and onto telephone 214C. As such, the single communication link will originate on a circuit switched network, bridge a packet-switched data communication network, and terminate on a second circuit-switched network.

Previous Doc Next Doc Go to Doc#

Previous Doc Next Doc Go to Doc#
First Hit Fwd Refs

Generate Collection

L12: Entry 2 of 8 File: USPT Aug 7, 2001

DOCUMENT-IDENTIFIER: US 6272339 B1
TITLE: Global mobile paging system

Detailed Description Text (2):
Referring to FIG. 1A, a satellite communications system 10 includes a constellation 12 of satellites 105, which may be in geosynchronous or non-geosynchronous orbits, a plurality of terrestrial gateways (GWs) 103, and a plurality of user terminals (UTs), also referred to herein as dual mode pagers or as user units 106, only one of which is shown. Each GW 103 has an associated GW service area 14, and is connected to a terrestrial telecommunications network, such as the public switched telephone network (PSTN) 102. A ground data network (GDN) 20 connects the GWs 103 to a ground operations control center (GOCC) 22. The GOCC 22 is responsible, among other things, for deriving long-term system resource allocation plans based at least in part on historic system usage patterns, and for communicating these plans to the GWs 103. The GWs 103 are responsible for implementing the long-term plans, as well as for making real-time adjustments to the plans to accommodate fluctuations in demand, the presence of RF signal obstructions and blockages between the satellites 105 and the user units 106, momentary fades, the presence of interference from external sources, and other factors that can influence the operation of the system 10.

Detailed Description Text (3):
The user unit 106 receives signals relayed through the satellites 105 to and from the GWs 103. GW antennas 15 provide forward feederlinks 15A and reverse feederlinks 15B, and for a non-geosynchronous satellite case (e.g., LEO or MEO) are capable of tracking the satellites as they move across the sky. The satellites 105 can be bent pipe repeaters that transmit a forward service link 16A to the UT 106 and that receive a reverse service link 16B from the UT 106. The user unit 106, if capable of voice and/or data communications, can be connected to the PSTN 102 though the GW 103, whose service area 14 contains the UT, and through one or more of the satellites 105. In a preferred embodiment of this invention the feederlinks 15A, 15B and the service links 16A and 16B are direct sequence (DS)-CDMA links, although in other embodiments TDMA links could be used as well.

Detailed Description Text (6):
One problem that may arise with a global paging system is that the user may have (a) turned off the user terminal; (b) moved into a building or to some location where the user terminal is blocked to the satellites; (c) moved to another location and is no longer able to be reached from the assigned gateway; or (d) or has selected a mode of terminal usage which prevents receiving the page signal. In any of these exemplary cases the user unit 106 is not capable of receiving satellite pages.

Detailed Description Text (57):
Reference is made to FIG. 6C for a method of message delivery to a user unit 106 that only has the terrestrial paging system 109 as a means of receiving a page. This method is useful where a user unit 106 is able to roam from one system to another, so long as the two systems are compatible. The page message is received by the gateway 103 and is sent to the paging subsystem 300 where it is formatted for

delivery. The gateway 103 checks for direct delivery by other means, and finds that the user unit 106 is only reachable by a terrestrial paging system. The gateway 103 verifies the general location of the user unit 106 from the location database and possibly from information provided by GW1. The gateway 103 then checks for a virtual gateway 107 that is compatible with the user unit 106 within range of the terrestrial paging system 109. If one is not found, an unable to deliver message is formulated and passed to the originating gateway 103. If a virtual gateway 107 that is compatible with the user unit 106 is found the gateway 103 sends a copy of the message and user ID to the message center 302 and makes a call alert to the selected virtual gateway 107. The virtual gateway 107 receives the call alert and sends a ready to receive ACK in reply. The ready to receive ACK is received by the gateway 103 which then assigns channel resources to the virtual gateway 107. The channel resource message is received by the virtual gateway 107 which then shifts to the assigned channel(s) and sends an ACK. The gateway 103, upon receiving the ACK from the virtual gateway 107, sends the page message. The virtual gateway 107 receives the page message and passes it to the pager interface unit 108. The pager interface unit 108 receives the page message and user ID, formats the message as required by the terrestrial paging system 109, and sends the formatted message via the link 113 to the terrestrial paging system 109. The terrestrial paging system 109 then operates according to its own procedures to deliver the message to the user unit 106. The user unit 106 receives the page message and displays the message to the user. An ACK of delivery (if available) is sent to the terrestrial paging system 109 by the user unit 106. The terrestrial paging system 109 receives the optional ACK and, if successful, forms a page delivered message and sends it to the pager interface unit 108 and thence to the virtual gateway 107. The virtual gateway 107 processes the ACK message and at an appropriate time, preferably with other traffic or messages, sends the page delivered ACK message information to the gateway GW2. The gateway 103 then sends a page delivery message to the originating gateway. If the message was unable to be delivered, an unable to deliver message is instead formed by the terrestrial paging system 109 and is passed to the paging interface unit 108 for eventual delivery back to the GW2. In this case a timer is activated for a later delivery retry. The retry after a specified length of time is directed to the call alert process of the gateway 103 so as to automatically trigger a redelivery attempt of the stored page message. If unsuccessful after "n" retries, the page message is deleted.

Previous Doc Next Doc Go to Doc#

Previous Doc Next Doc Go to Doc#
First Hit Fwd Refs

Generate Collection

L5: Entry 30 of 34 File: USPT Jul 3, 2001

DOCUMENT-IDENTIFIER: US 6256671 B1
TITLE: Method and apparatus for providing network access control using a domain name system

Application Filing Date (1):
19980624

Detailed Description Text (9):
The Internet 140 is a combination of multiple conventional hardware components, including computer systems, routers, repeaters, gateways, and communications links spread throughout the world. These hardware components are organized hierarchically to provide multiple logical levels of networks. The hardware components of Internet 140 interact to route data from one computer system to another. According to one implementation, data is transferred between computer systems using the well-known Transmission Control Protocol/Internet Protocol (TCP/IP) protocol. The data is typically transferred in units referred to as "packets". Typically, each packet includes data, a source address identifying the system which initiated the packet and a target address identifying the system to which the packet is to be sent. Additional control information, such as a checksum, may also be included in the packet. The number of bytes of data contained within a packet is dependent on the network protocol being used.

Detailed Description Text (10):
A client system 110 accesses a host system 120 by providing an Internet Protocol (IP) address of the host system 120. According to one implementation, the IP address is a 32 bit number in the format of four numbers separated by three periods, shown generically as "xxx.yyy.zzz.nnn". Each of the four numbers can range from 0 to 255. However, it is to be appreciated that other IP addressing formats can be used as well.

Detailed Description Text (11):
A domain name system (DNS) has been developed which maps particular host names to IP addresses, allowing users to identify host systems in a more user-friendly manner. These host names are typically in the form of two or three words or phrases separated by periods and are much easier for individuals to use. Examples of such host names include "www.baynetworks.com" and "www.uspto.gov". Although communication between client and host systems over the Internet uses the IP addresses, users can interface with their network software applications, such as Internet browsers, using the host names.

Detailed Description Text (12):
During operation, a user of a client system 110 inputs a uniform resource locator (URL) containing a host name to the Internet browser at the client system. In order to access the host system 120 targeted by the URL, the browser attempts to identify the IP address mapped to the host name embedded in the URL. The browser extracts the host name from the URL in a conventional manner and sends a DNS query to a DNS server 160 via the ISP 130 requesting the IP addresses for the host name. It is to be appreciated that there may be many IP addresses assigned for a single host name. An additional DNS proxy may also be situated between the client systems 110 and

ISPs 130, as discussed in more detail below. Each DNS server 160 stores a mapping of host names to IP addresses. When a DNS server 160 receives a DNS query, it searches for a mapping and, if found, responds with the corresponding address(es). If not found, it forwards the query to an additional DNS name server(s) 160. Note that, given the infinite number of host names, no one DNS server 160 stores all mappings.

Detailed Description Text (13):
When a DNS name server 160 which is aware of the IP address for the queried host name returns the IP address to the Internet browser, the browser is then able to access the host system targeted by the URL. However, if none of the accessed DNS name servers 160 are aware of the IP address for the queried host name, then a "name error" message is returned to the browser indicating that the requested host name could not be located.

Detailed Description Text (14):
The communication links illustrated in FIG. 1 may be any of a wide range of conventional communication media, and may be different for different systems 110, host systems 120, and ISPs 130. For example, a communication link may be a cable, a fiber-optic cable, or may represent a nonphysical medium transmitting electromagnetic signals in the electromagnetic spectrum. Additionally, a communication link may also include any number of conventional routing or repeating devices, such as satellites or electromagnetic signal repeaters.

Detailed Description Text (18):
The gateway 250 may also include a DNS proxy 260. The DNS proxy 260 manages DNS queries from Internet browsers executing on client systems 210, 220, and 230. As used herein, the client system originating a DNS query is referred to as the source of that DNS query. The DNS proxy 260 includes a local cache 265 for temporarily storing address to identifier mappings. In the illustrated embodiment, the addresses are IP address and the identifiers are host names. The DNS proxy 260 operates as a reduced-feature DNS name server. The DNS proxy maintains a smaller local memory (cache 265) and does not provide long-term storage of host name to IP address mappings. Additionally, the DNS proxy 260 does not maintain a record of "authority" information for any host name to IP address mappings. Thus, if an authority for a particular host name to IP address mapping is required, DNS proxy 260 obtains it from an authority DNS name server on the Internet. The local cache 265 is typically on the order of 100 Kbytes to 16 Megabytes of storage space as opposed to the larger storage spaces, on the order of hundreds of megabytes or gigabytes, used by the DNS name servers. In alternate embodiments, the DNS proxy 260 can be a fully functional DNS name server, including permanent mapping tables and authority information.

Detailed Description Text (19):
Upon receipt of a DNS query from a network application over the network 240, the DNS proxy 260 checks its local cache 265 to determine whether it has cached the requested IP address to host name mapping. If the local cache 265 includes the requested IP address to host name mapping, then the IP address is returned to the source of the DNS query, and thus the network application, subject to the access management controls discussed below.

Detailed Description Text (20):
However, if the local cache 265 does not have the requested IP address to host name mapping, then the DNS query is forwarded by the DNS proxy 260 to one or more other DNS name servers on the Internet. In accordance with the DNS protocol, the query may be forwarded to various other DNS name servers on the Internet until a DNS name server which stores the appropriate IP address to host name mapping is accessed. The DNS name server which stores the mapping then sends a message via the Internet to the DNS proxy 260 identifying the IP address. The DNS proxy 260 in turn forwards the IP address to the requesting Internet browser, subject to the access management

DOCUMENT-IDENTIFIER: US 6513069 B1
TITLE: Enhanced video programming system and method for providing a distributed community network

Application Filing Date (1):
19990915

Detailed Description Text (3):
One system consistent with the present invention combines the rich visual capabilities of video with the vast resources of the Internet. As shown in FIG. 1, an embodiment of the invention is a computer based system for receiving a video program along with embedded uniform resource locators (URLs)--which direct the user's computer 16 to address locations, or Web sites, on the Internet 20 to retrieve related Web pages. These Web pages correspond to the video presentation. The particular video programming can be delivered in analog, digital or digitally compressed formats (e.g., MPEG2) via any transmission means, including satellite, cable, wire, television broadcast or sent via the Web.

Detailed Description Text (7):
Once the video program is created, it can be transmitted to user sites over any transmission means, including broadcast, cable, satellite, or Internet, and may reside on video servers. Furthermore, the video program, with or without embedded URLs, can be encoded on a VHS or Beta tape, DVD or other medium.

Detailed Description Text (51):
The method essentially follows the same core pattern as IP routing and DNS lookups. If a message is for a member not belonging to the current Area 192 or group, the message shall be routed through the Distributed Communication System until its destination, or someone who knows the destination and can deliver the message, is found.

Detailed Description Text (57):
The unique aspects of this architecture, using database servers as routing gateways, using techhiques resembling IP routing and DNS lookup, enables this system to serve with minimum administration and configuration and with lower end, cost-effective hardware.

Detailed Description Text (66):
FIG. 10A is a diagram of an exemplary physical network configuration for implementing a distributed community network 200. The configuration includes client machines 204, 206, 208 connected through a network 202 to a hub 220 within a server 210. Network 202 may represent, for example, the Internet, a wide-area network, a local area network, or an intranet. Network 202 may also comprise a cable TV distribution medium, broadcast medium, satellite broadcast, telephone lines, fiber optics, or any other conventional transmission medium. Each of the client machines includes access to particular services managed by corresponding servers. Client machine 204 provides donut, chat, and whiteboard services to a client or user at that machine, for example. Client machine 206 provides donut and whiteboard services. Client machine 208 is a conventional television. A client machine may

also comprise a digital TV, a TV with a digital or analog cable box, or a computer connected with a TV.

Detailed Description Text (70):
For the services, the servers may provide many types of content such as, for example, video, audio, and multimedia. Web browsers for communicating with the server may be located in various places such as, for example, on a user machine, in a cable head end, in a satellite operations center, or in a set-top box. The web browsers may obtain the content in realtime, or it may be prefetched and cached either locally or on the server. In addition to web browsers, other entities may obtain content.

Detailed Description Text (73):
FIG. 10B provides an example of use of the network in FIG. 10A for a particular application. For instance, during a Jets v. Giants professional football game, a user, Bob, first switches his cable set-top box to the appropriate video channel for the game. The video originates at a television operations center, is transmitted via satellite to a cable head end, then through a cable plant to Bob's set-top box. Bob also connects to the Internet 202 on his computer and accesses the matching HyperTV web page, involving a particular network service. This web page is located on a server in the point of presence for the service. The point of presence configures Bob's machine 204 into distributed community network 200. Machine 204 opens a persistent socket on configured hub A (220) and sends a subscribe message to configured chat service 218 via hub C (222). In response to the subscribe message, chat service 218 sends an announcement packet to all the members of the configured room via hub A (220) and the Internet 202. In addition, chat service 218 subscribes Bob to the appropriate push/pull service 228 via hubs C (222) and B (224).

Detailed Description Text (86):
FIG. 11B is an exemplary diagram of a physical network configuration 259 for a distributed community network illustrating an alternative source for a video signal. Configuration 259 illustrates conventional distribution of video or television content using cable television signals. An operations center 261 generates a cable television signal having content for distribution and transmits the cable television signal over a satellite link 263 to one or more cable head ends 265. Cable head end 265 can include a web browser for interacting with a network such as the Internet 202. Cable head end 265 receives the cable television signal from satellite link 263 and distributes the signal over cable lines to client machines 267. Alternatively, the operations center can transmit over a satellite link to the client machines, foregoing the cable route. Client machines 267 may represent conventional televisions or any machine capable of displaying cable television signals (such as a personal computer with a TV card or module for processing TV signals for display). Client machines 267 may also include connection to a network such as the Internet 202 for implementing a distributed community network.

Detailed Description Text (88):
The media content may include, for example, video, audio, combined video and audio, or multimedia content. When transmitting different types of media content, such as both video and audio, the media content may be transmitted from the same or different sources. In addition, the content may be transmitted from a wide variety of sources such as, for example, television, broadcast television, cable, satellite, local video, and local CD-ROM or digital versatile disk (DVD). The local content may be stored on the hard disk drive of a user's machine.

CLAIMS:

37. The distributed community network of claim 33, wherein the network is accessed by the client machine utilizing a communications medium selected from the group

consisting of: the Internet, intranet, private network, public network, radio frequency broadcast, wireless connection, satellite broadcast, cable, telephone circuit, and a fiber optics circuit.

Previous Doc Next Doc Go to Doc#

Previous Doc Next Doc Go to Doc#
First Hit Fwd Refs

Generate Collection

L5: Entry 14 of 34 File: USPT Mar 9, 2004

DOCUMENT-IDENTIFIER: US 6704873 B1
TITLE: Secure gateway interconnection in an e-commerce based environment

Application Filing Date (1):
19990730

Detailed Description Text (1103):
In addition to the very lure of interesting information on the Internet, there are vulnerabilities inherent to Internet technologies which can make that information more easily compromised. In fact, the original intent of the Internet was to share information, not to be used as a business tool. Security weaknesses are widespread and present in nearly all Internet related technologies. The very communication protocol used, TCP/IP, was designed with few provisions to protect the security of the data packet.

Detailed Description Text (1106):
The Internet also brings with it a whole new set of legal issues, and topping the list are potential privacy implications. Businesses can now track your every movement on the Internet, from your email and IP addresses, to each site you surfed to and which ad one clicked. Does this constitute an invasion of your privacy? One may have freely given other businesses sensitive information aboutonerself, such as one's credit card number or one's social security number. To what lengths must that business go to in order to protect that information? If and when that information is compromised, who is liable? What is the penalty for breaking into a computer to which one is not granted access? What if one just looks around and does not cause any damage? These questions are just beginning to be addressed as cases are introduced in court and legislation is passed in Congress. But we are a long way from finding all the answers.

Detailed Description Text (1159):
Based on your answers to these questions, there are a number on encryption solutions available for implementation. If one is running a Netscape web server, one may want to consider Secure Sockets Layer, or SSL, which provides data encryption, server authentication, message integrity, and optional client authentication for a TCP/IP connection. Another WWW security solution is Secure Hypertext Transfer Protocol (S-HTTP), which is a security-enhanced version of HTTP, developed by Enterprise Integration Technologies (EIT). S-HTTP supports end-to-end secure transactions by incorporating cryptographic enhancements to messaging at the application level. Pretty Good Privacy, or PGP, is a common encryption solution for electronic mail. PGP may both authenticate the sender of the message, and encrypt the contents of the message through the use of a public key/private key pair. In electronic commerce solutions, the Secure Electronic Transactions (SET) specification which is being jointly developed by Visa and MasterCard may be considered. SET may require authentication of all parties involved with a credit card transaction through the use of digital signatures and certificates, and may use a separate encryption handshake in order to guarantee both confidentiality and integrity. Other encryption solutions include Point to Point Tunneling Protocol (PPTP), Private Communication Protocol (PCT), or the use of CryptoAPI. Some available encryption options are depicted in the following Encryption Matrix:

Detailed Description Text (1233):
ReTA implements file transfer services through Microsoft's Internet Information Server 4.0 (IIS) using the HyperText Transfer Protocol (HTTP). Within a Web-based environment, Web servers transfer HTML pages to clients using HTTP. HTTP can be thought of as a lightweight file transfer protocol optimized for transferring small files. HTTP reduces the inefficiencies of the FTP protocol. HTTP runs on top of TCP/IP and was developed specifically for the transmission of hypertext between client and server.

Detailed Description Text (1488):
When using the Internet-based net-centric model 5100, as shown, for example, in FIG. 51, Internet standards such as TCP/IP, HTML and CGI are used to publish, interact, and transact with data/content on the public Internet 5102. Typically, a firewall 5104 is implemented to secure a service provider's internal resources 5106 from the public Internet. A service provider locates Internet-based resources outside of the firewall and may provide controlled access from the web to internal information through mechanisms such as CGI 5108. Access to Internet resources may be through web browsers as depicted or via other mechanisms such as e-mail or ftp.

Detailed Description Text (1531):
Managing hardware is all hardware directly used to manage the environment. This includes all staging components. These components are devoted to systems management functions. Examples of managing hardware include management servers, management controllers, management consoles, probes, and sniffers. One significant component in the hardware monitoring arena is Firewall access control policy management. Firewalls are regularly used for network based security management. It is typically a system or group of systems that enforce access control between two or more networks and/or perform network data packet filtering. Usually packet filtering router hardware and application gateways are used to block unauthorized IP packets and enforce proxy defined user commands.

Detailed Description Text (1675):
Lightweight Directory Access Protocol (LDAP) is the underlying protocol used by Site Server Membership to communicate with the Membership Directory. LDAP was designed to be the standard Internet protocol for accessing directory services. LDAP runs on TCP/IP networks and is independent of platform, allowing directory-based information to be shared across operating systems. Site Server Membership implements an LDAP service for reading and writing information to the Membership Directory database.

Detailed Description Text (2970):
Latency is typically the second most important quality considered after bandwidth in performance analysis. Latency is the time delay from delivery of the first bit of the packet to the network until the receipt of the last bit of the packet at the destination. A satellite link may have a line speed of 512 Kbps, but a latency of half a second. This means that it takes half a second for a signal to travel from the sender to the satellite and then to the receiver. From a performance standpoint, latency may add a delay in the response time of all applications. Latency is particularly important to consider in interactive applications. In batch applications the latency may not be as critical. If a packet crosses the network in a relatively short period of time, it is said to have low latency. High latency occurs when packets take long periods to cross a network. Latency is also referred to as propagation delay and network response. Latency is often dependent on the type of data that is being transmitted. Data can be broken up into two types: isochronous and plesiochronous. Isochronous data has a Constant Bit Rate (CBR) and must be transmitted through regular discreet intervals such as voice and video. Plesiochronous data is not constant; it has a Variable Bit Rate (VBR). Examples of this type include file transfers and most types of LAN traffic. Note that although a voice transmission requires minimal bandwidth, it has a constant bit rate

Previous Doc Next Doc Go to Doc#
First Hit Fwd Refs

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L5: Entry 12 of 34 File: USPT Apr 13, 2004

DOCUMENT-IDENTIFIER: US 6721790 B1
TITLE: User settable unified workstation identification system

Application Filing Date (1):
20000309

Brief Summary Text (5):
When multiple data processing equipments and/or computing devices are interconnected to form a Local Area Network (LAN), each has to have an unique Network Address so that information can be routed to the intended terminal. When a LAN is interconnected with others through Wide Area Network (WAN) such as Internet, each LAN has to be assigned with an Internet Protocol Address (IP Address) for similar purpose. Both of these systems have been using an uniform identification format of four decimal numbers each ranging from 0 to 255, separated by the symbol "." (period). Thus, this has been referred to as the "Dotted-Decimal" notation.

Brief Summary Text (7):
In addition, to distinguish and route WAN and LAN traffic among LANs and within a LAN, respectively, a SubNet Mask is used to segregate the IP Address information in messages. Although it functions based on binary algebra of utilizing "0" & "1" for screening, this Mask is also presented in the Dotted-Decimal notation.

Brief Summary Text (8):
Furthermore, certain terminal (or node) in a LAN or a WAN maintains a database that is capable of translating a terminal's ~~IP~~ Address to a alpha-numerical name, or vice versa. They are known as DNS (Domain Name Server). This is important because human users would prefer to specify terminals by names that have some meaning, not by the ~~Dotted-Decimal IP~~ Address that is concise for data processing equipment. A terminal without such facility, would need to be pre-stored with an IP Address that points to a DNS to function properly. Normally in a LAN, the DNS will be the Gateway, because it is the most logical candidate to possess such capability. Even if it does not have a database, it has the most direct access to a DNS in the WAN by virtual of the network architecture.

Brief Summary Text (9):
All combined, these four sets of Dotted-Decimal numbers, which are commonly referred to in the art as ~~TCP/IP (Transmission Control Protocol/Internet~~ Protocol) Properties, are very important parameters for the proper operation of data WANs and LANs. However, they are rather meaningless numbers for human users.

Brief Summary Text (10):
Traditionally, data WANs and LANs are set up and maintained by specially trained personnels with job titles such as Network Manager or Network Administrator who deal with the TCP/IP Properties daily. The IP Address of Internet nodes is coordinated by organizations such as Network Solutions <www.networksolutions.com>. The end users of the data equipments, however, have very little knowledge about these network parameters. To them, this is a somewhat mysterious subject.

Brief Summary Text (14):

One of them is the assignment and maintenance of the IP Address in a LAN and the Extension Number in a PBX. Unique identification codes need be assigned to all users for a LAN or a PBX to begin to function. If these numbers are not properly managed, operation of these systems can easily be disrupted.

Brief Summary Text (16):
The Extension Number in a PBX is not as difficult a subject as the IP Address in a LAN, because the Extension Numbers are published in a business' directory and are being used in daily operation. It is relatively easy to correlate such a number to a co-worker's name. The IP address of a data processing equipment, on the other hand, is too remote to most people.

Brief Summary Text (20):
The HomePNA Adapters, on the other hand, are still evolving from its data LAN origin. Among other parameters that may affect their operation, the setting of "IP Address" is still a nontrivial task reserved for the experienced.

Brief Summary Text (21):
One approach of attempting to ease this difficulty has been practiced in the LAN technology for some time. It is termed DHCP (Dynamic Host Configuration Protocol). It enables the Gateway of a LAN to automatically assign a set of values to a Client as its IP Address. This relieves the burden on the Network Manager who has to oversee the operation of the LAN. Because the DHCP process is somewhat random, however, the IP Address assigned by the Gateway becomes even less predictable. It makes troubleshooting more difficult. For example, when a new terminal is installed onto a LAN, it could receive an IP Address assignment that has already been used by another terminal which happened to be not active. Conflict arises in the future when both of these terminals are powered on at the same time. To avoid this unpredictable situation, some Network Managers would rather keep DHCP feature disabled.

Brief Summary Text (22):
Nevertheless, it is interesting to note that among the four sets of Dotted-Decimal parameters that each data processing equipment in a LAN has to have, only the fourth number of a terminal's own "IP Address" is a variable necessary for uniquely identifying it. All of the other numbers are either a fixed template (first three numbers in the "IP Address" and the full "SubNet Mask") of the type of LAN that the terminal belongs to, or the "IP Address" of the "Gateway" and the "DNS" in the same LAN, which are pre-defined because such nodes have to be set up first. So, the task of identifying a data processing equipment can be reduced to the selection of a number between 0 and 255 that is unique within the same LAN. This narrowed scope of task would make the setting of TCP/IP Properties manageable.

Brief Summary Text (26):
In accordance with my invention, the data link between a data processing equipment and its associated HomePNA adapter is routed through the voice networking control module DPABX at each location. So that, the Extension Number chosen by an user for operating the DPABX can also be utilized to define the IP Address of the data processing equipment. The data processing equipment can obtain this Extension Number and update its own TCP/IP Properties, as frequently as desired. So that, the address identification of a data processing equipment is always in synchronism with the Extension Number set by the user of the voice communication instrument.

Drawing Description Text (4):
FIG. 3 is an example of TCP/IP Properties that a data terminal may possess.

Detailed Description Text (11):
C. Modem 115 may be constructed with one of several other technologies, such as coaxial cable, radio, fiber optics or satellite. If one of these is utilized, the connection between the modem 115 and the Internet 102 would no longer rely on the